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CESARI AND MCKENNA, LLP 88 BLACK FALCON AVENUE BOSTON, MA 02210			CHUNG, JI YONG DAVID	
			ART UNIT	PAPER NUMBER
			2143	
DATE MAILED: 09/08/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/027,020

Applicant(s)

SARMA ET AL.

Examiner

Ji-Yong D. Chung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Remarks*

1. Applicant's arguments and amendments filed on June 20, 2005 have been carefully considered but they are not deemed fully persuasive. The discussion of Applicant's arguments follows.

In reference to **claim 1**, Applicant urges that Gross (referenced prior art) is silent concerning the Applicant's claimed invention. The thrust of the Applicant's argument is that Gross never discloses changing disks to "an un-owned state" and then to a "state of destination file server ownership from the un-owned state."

The execution of "vgexport" results in "un-owned" state; the server in which vgexport is executed 'exports' the file system (and thus "un-owning" them). The execution of "vgimport" results in "owned" state.

In reference to **claim 9**, Applicant argues that Gross does not disclose writing a first log file and writing a second log file. As indicated in the first Office Action, lvmtab file serves as the first log file and volume\_group file serves as the second log file. A log file is a written record of a file transaction. Lvmtab records creation of logical volumes; Volume\_group file records the creation of volume groups.

In reference to amended **claims 4 and 6**, Applicant is referred to the remainder of instant Office Action.

In reference to **claim 8**, the Examiner agrees with Applicant's contention that Noveck does not qualify as a prior art reference. Therefore, the original rejection is withdrawn. In the instant Office Action, claim 8 is rejected based on new ground.

***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. **Claims 1-3 and 9-15** are rejected under 35 U.S.C. 102(e) as being anticipated by Gross et al (Pat. No. 6,128,734, Gross hereinafter).

With respect to **claim 1**, Gross shows a method *of transferring ownership of a volume comprising the steps of:*

*changing ownership of the plurality of disks to an un-owned state from a state of source tile server ownership* [See vgexport command on lines 49-55, column 9];

*changing ownership of the plurality of disks to a state of destination file server ownership from the un-owned state* [See vgimport command on lines 49-55, column 9].

With respect to **claim 2**, Gross shows *the step of changing ownership of the plurality of disks to an un-owned state further comprises the steps of:*

*changing a first ownership attribute of the disks to an un-owned state* [See lines 55-60, column 9. The vgexport removes /dev/volume\_group from /etc/lvmtab file]; and

*changing a second ownership attribute of the disks to an un-owned state* [See lines 55-60, column 9. The vgexport removes the device files associated with /dev/volume\_group from the system].

With respect to **claim 3**, Gross shows *the step of changing ownership of the disks to a destination file server ownership further comprises the steps of:*

*changing a first ownership attribute of the disks to a destination tile server state* [See lines 1-12, column 10. The vgimport adds /dev/volume\_group to /etc/lvmtab file]; and

*changing a second ownership attribute of the disks to a destination file server state* [See lines 1-12, column 10. The vgimport adds the devices files associated with /dev/volume\_group to the system].

With respect to **claim 9**, Gross shows *a method of transferring ownership of a volume having a plurality of disks comprising the steps of:*

*writing a first log file to record a first part of a transfer process*; [The vgexport causes lvmtab file to be rewritten. The first part of transfer process is therefore recorded in lvmtab. The file system is no longer within the system; therefore it is in “un-owned” state. See lines 55-60, column 9]

*performing the first part of the transfer process , the first part of the transfer process being transferring ownership from a source server to an un-owned state* [The vgexport removes

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device files. The removal causes the system to no longer “own” the file system, as the file system no longer exists on the server. See lines 55-60, column 9];

*writing a second log file to record a second part of the transfer process* [The vgimport causes /dev/volume\_group to be written. File volume\_group serves as a “log,” which serves as a record of transactions. See lines 1-12 in column 10. Note that volume\_group also serves as a configuration file]

*performing a second part of a transfer process, the second part of the transfer process being transferring ownership from the un-owned state to a destination server.* [The vgimport cause lvmtab to be rewritten. The file system is imported, and is thus “owned” by the system. See lines 1-12, column 10]

**Claims 10-15** incorporates all the limitations of claims 1-3, but in computer product form and apparatus form rather than in method form. The reasons for the rejections of claims 1-3 apply to claims 10-15. Therefore, claims 10-15 are rejected for substantially the same reasons.

### ***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 4-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross in view of Matsunami et al (Pub No.: 2002/0099914, Matsunami hereinafter).

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With respect to **claim 4**, Gross shows:

*sending a first message to a source file server, the message containing a request for transferring ownership of a volume of disks* [ See lvremove command on lines 35-38, column 4. The command is in UNIX. Removing the group removes the ownership of the volume, because it removes the volume];

*receiving a response from the source file server* [It is inherent in the execution of lvremove command to give a response, which would then be transmitted back to the client];

*if the response contains abort information, aborting the transfer* [If the command were unable to execute, lvremove has inherent capability of generating an error message, in which case any further steps for disk transfer cannot execute. The aborting capability (or sending an abort message) is inherent in lvmremove].

*if not, verifying that the volume can be transferred* [Each LVM commands has internal error checking. When a string of them is executed, the last one serves as the step for “verifying.” If any of the steps fails, the overall execution fails (“aborts”)];

*if the volume can be transferred, sending a second message to the source file server to perform the first part of a transfer process to transfer ownership from the source file server to an un-owned state* [vgremove can be used. vgremove is one of the commands inherent in LVM];

*receiving a response from the source file server after it performed the first part of the transfer process* [the execution of LVM manager command, vgremove generates either error message or a successful return message. The feature is inherent in LVM.]; and

*in response to the step of receiving, performing a second part of a transfer process to transfer ownership from the un-owned state to a destination file server [vgcreate is one of the commands inherent in LVM].*

Gross does not show each of the above steps in combination.

Matsunami, however, shows a network environment in which disk transfer maybe made from one server to another.

It would have been obvious to one of ordinary skill in the art at the time of the invention to remove a set of disks from one server and to reallocate it to another, because the reallocation allows one to reuse disks.

In addition, it also would have been obvious to one of ordinary skill in the art at the time of the invention to sequence the steps given above in order to move physical volumes from one server to another. Moving the disks *requires* the following steps (which are the summary of the steps in the claim) to be executed in proper sequence. (1) transmission and reception of commands from a client station (2) the removal of all LVs (vgremove will generate an error if there are any logical volume which exists on the volume group) (3) the removal of the volume group and physical volumes, and (4) recreation of volume groups, using the same physical volumes, in another server. They must all be executed; otherwise, volume transfer would not work.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use LVM commands (either inherent or otherwise) given in Gross with Matsunami's system, because, as it is shown in Fig. 11, LVM (item 252) is part of Matsunami's system. The Management Console (301) can generate (either via scripting or user input) proper LV



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commands to LVM on the server, to release the disks to be transferred, as explained for removing a volume and to install the disks on a different server.

With respect to **claim 5**, Gross's LVM has commands that are inherent and meet the following limitations:

*changing a first ownership attribute of the disks to a destination file server state*  
[vgcreate, part of LVM, creates the volume information on the disks].

Matsunami shows

*changing a second ownership attribute of the disks to a destination tile server state.*

Matsunami shows the feature that reads on "second ownership attribute." See WWN in Fig. 3 of Matsunami. It must be set to a new ownership value upon setting a new host server.

With respect to **claim 6**, Matsunami shows steps of:

*verifying that the disks can be transferred in response to an initial request from a destination file server* [The management console is opened at a server, as it can be at any terminal. See Fig. 7 for forming disk pool that can be used. The execution of the management console would send the first message from the server];

*sending an acknowledgement by the source file server to the destination file server* [See paragraph 0071 The server name is entered to LUN forming program interface, which communicates to the destination server];

*receiving a second request from the destination file server* [See paragraph 0071. The server sends a response back];

*aborting if the second request contains abort information* [The paragraph 0078 speaks of preventing access conflict];

*changing the volume to an off-line status in response to the second request not containing abort information* [Removing a volume group from the source server (See the discussion of claim 5, in reference to part of limitation that reads on Gross) makes it “off-line.” ]

*performing a first part of a transfer process, the first part of the transfer process being transferring ownership of the source file to an un-owned state* [See the discussion of claim 4 above in reference to part of the limitation that reads on Gross]; and

*sending a message to the destination file server to prompt a second part of the transfer process, the second part of the transfer process being transferring ownership from the un-owned state to the destination server* [See 0095. Pool manager sends notice to the pool management agent. See the discussion of claim 4 for relevant part of the limitations that reads on Gross].

With respect to **claim 7**, Gross’s LVM has commands that are inherent and meet the following limitations:

*changing a first ownership attribute of the disks to an un-owned state* [pvremove removes the LVM information on the disk].

Matsunami shows *changing a second ownership attribute of the disks to an un-owned state*.

Matsunami shows the feature that reads on “second ownership attribute.” See WWN in Fig. 3 of Matsunami. See paragraph 0078, which talks about erroneous deletion. Upon deletion, WWN must be set to null to indicate availability.

6. **Claims 16-25** are rejected under 35 U. S. C. 103(a) as being unpatentable over Matsunami, in view of Delaney et al. (Pub. No. 2003/0097611, Delaney hereinafter)

With respect to **claim 16**, Matsunami does not show, but Delaney shows, journal (“writing changes to a log file”). The journal is written automatically for the changes that are made to the file system.

Matsunami shows a method comprising:

*changing a first attribute of ownership from source server ownership to an un-owned state by writing the change to a log file and rewriting the first attribute of ownership on the disk* [vgremove command using LVM on Matsunami causes attached disks to be no longer associated with a server (“changing a first attribute of ownership from source server ownership to an un-owned state”). Vgremove removes metadata actually on a disk to be removed. The erased ata contains physical volume information for the first server. The first physical volume information is “first ownership attribute”].

*changing a second attribute of ownership from source ownership to an un-owned state by writing the change to a log file and rewriting the second attribute of ownership on the disk* [vgremove command using LVM on Matsunami causes attached disks to be no longer associated with a server (“changing a second attribute of ownership from source server ownership to an un-owned state”). Vgremove removes metadata actually on a disk to be removed. The erased ata contains logical volume information for the server. The logical volume information is “the second ownership attribute”].

*changing the first attribute of ownership from the un-owned state of ownership to destination server ownership* by writing the change to a log file and *rewriting the first attribute of ownership on the disk* [vgcreate command using LVM on Matsunami causes attached disks to be associated with a server (“changing the first attribute of ownership from the un-owned state of ownership to destination server ownership”). Vgcreate writes metadata onto volume to be owned. The written data contains physical volume information for the server. The physical volume information is the “first ownership attribute”]; and

*changing the second attribute of ownership from the un-owned state to destination server ownership* by writing the change to a log file and *rewriting the second attribute of ownership on the disk* [vgcreate command using LVM on Matsunami causes attached disks to be associated with a server (“changing the second attribute of ownership from the un-owned state of ownership to destination server ownership”). Vgcreate writes metadata onto the volume to be owned. The written data contains logical volume information for the server. The logical volume information is the “second ownership attribute”].

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate journaling to recycle network disk drives, to reuse available disk resource, and therefore, to remove disks from one server and to move it to another.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate journaling (as shown in Delaney) to recycle network disk drives, so that the recycling process would be recoverable in case of failure. The whole purpose of having a journal is to for recovery, as stated in Delaney paragraphs 003-004.

With regard to **claim 17**, Delaney speaks of recovery in the event of recovery using the log (See paragraph 003 and 004). Matsunami shows the basic framework for disk reallocation (“transfer ownership.”)

It would have been obvious to one of ordinary skill in the art at the time of the invention to transfer ownership utilizing the log, because using Delaney and Matsunami, (1) one would be able to recover the system after a failure and (2) one would be able to repeat the earlier procedure of disk transfer using the recovered system. The motivation is simple: to complete the transfer of the disks that was attempted prior to the interruption caused by the failure.

**Claims 18 and 19** substantively incorporate the limitations of claims 16 and 17, but in apparatus form rather than in method form. The reasons for the rejections of claims 16 and 17 apply to claims 18 and 19.

In reference to **claims 20**, its scope is broader than that of claims 18. As shown by dependent claims 24-25, limiting “first computer” and “second computer” as “the source server” and limiting “third computer” and “fourth computer” as “destination server” will define a claim whose scope maps substantively to claim 18. Thus, the reasons for the rejections of claims 18 apply to claims 20.

**Claim 21** substantively incorporates the limitations of claim 19. The reasons for the rejections of claim 19 apply to claim 21.

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In reference to **claims 22 and 23**, Matsunami shows all of the elements of claims 22 and 23, including the one “destination server” / “single computer.” See Fig. 1.

It would have been obvious to one of ordinary skill in the art at the time of the invention to return a given set of disks to a pool, and then, based upon later need, to reacquire the disks for other projects, for a single computer. The motivation for cycling resource is to maximize disk availability to servers that need them.

**Claims 24 and 25** substantively cite limitations that are broader than those of claim 18. The reasons for rejection of claim 18 apply to claims 24 and 25.

7. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunami and Gross and further in view of Delaney.

In reference to **claim 8**, except for the steps regarding log files, all of the elements of the claim have been discussed with respect to claims 4-7.

Neither Matsunami nor Gross shows the following:

*writing a first destination log tile;*

*writing a first source log file;*

*writing a second destination log file;*

*writing a second source log file;*

*writing a third source log file;*

*writing a third destination log file; and*

*erasing the previously written logs.*

Delaney shows logging associated with volume creation and volume destruction. See paragraphs 003 and 004. In the preceding combination of Matsunami, Gross and Delaney, the log would be written at both the destination and the source servers and then erased when the written logs are filled up.

It would have been obvious to one skilled in the art at the time of the invention to log file system transactions in a log file, because as Delaney explains in paragraph 002, the logging (journal) would make the system more reliable and stable in the event of a system problem.

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***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ji-Yong D. Chung whose telephone number is (571) 272-7988. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Ji-Yong D. Chung  
Patent Examiner  
Art Unit: 2143

  
DAVID WILEY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100